

October 23, 2006

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: **Docket Nos. 50-361 and 50-362
Additional Information Supporting the Third Ten-Year Inservice Inspection
(ISI) Interval Relief Requests ISI-3-24 and ISI-3-25 for the Use of Structural
Weld Overlay and Associated Alternative Repair Techniques
San Onofre Nuclear Generating Station, Units 2 and 3**

- References: 1) Letter from A. E. Scherer to the U. S. Nuclear Regulatory Commission dated June 30, 2006; Subject: Docket No. 50-362, Third Ten-Year Inservice Inspection (ISI) Interval Relief Request ISI-3-24, Use of Structural Weld Overlay and Associated Alternative Repair Techniques, San Onofre Nuclear Generating Station, Unit 3
- 2) Letter from A. E. Scherer to the U. S. Nuclear Regulatory Commission dated July 14, 2006; Subject: Docket Nos. 50-361 and 50-362, Third Ten-Year Inservice Inspection (ISI) Interval Relief Request ISI-3-25, Use of Structural Weld Overlay and Associated Alternative Repair Techniques, San Onofre Nuclear Generating Station, Units 2 and 3

Dear Sir or Madam:

This letter provides additional information in response to questions from Nuclear Regulatory Commission staff reviewers. The answers to the questions are provided in the enclosure to this letter, in support of both ISI-3-24 and ISI-3-25 (References 1 and 2).

Should you have any questions, please contact me.

Sincerely,



Enclosures: As stated

cc: B. S. Mallett, Regional Administrator, NRC Region IV
N. Kalyanam, NRC Project Manager, San Onofre Units 2 and 3
C. C. Osterholtz, NRC Senior Resident Inspector, San Onofre Units 2 and 3

Southern California Edison (SCE)

San Onofre Nuclear Generating Station (SONGS), Units 2 and 3

Docket Nos. 50-361 and 50-362

Enclosure

Responses to NRC Staff Questions Regarding ISI-3-24 and ISI-3-25

NRC Question 1:

Identify the UT acceptance criteria that will be used for the complete full structural weld overlay and heat affected zone beneath the weld overlay. If the acceptance criteria to be used are not consistent with the respective positions stated in Regulatory Guide 1.147 for the applicable code cases, provide the technical bases for its use.

SCE Response to Question 1: (Applies to both ISI-3-24 and ISI-3-25)

The examinations of the completed full structural weld overlay and heat affected zone beneath the weld overlay will be performed in accordance with the requirements of Code Case N-504-2 and Appendix Q, including the flaw acceptance standards specified in Article Q-4000. These inspections, and associated acceptance standards provide full assurance that the weld and adjoining base material are fully capable of performing their intended function. Thus it is SCE's intent to meet the condition specified in Regulatory Guide 1.147 for the use of Code Case N-504-2. The following discussion is provided to clarify how SCE will comply with the condition specified in Regulatory Guide 1.147.

ASME Section XI pre-service acceptance standards, as specified in Appendix Q, are the appropriate standards for pre-service ultrasonic examinations of weld overlay repairs to nuclear plant components. These standards are consistent with the highly sensitive ultrasonic examination procedures being used, which are qualified in accordance with ASME Section XI, Appendix VIII, Supplement 11 as implemented via the EPRI Performance Demonstration Initiative (PDI). The post-repair inspection volume includes the full thickness of the weld overlay plus 25% of the underlying base metal/weldment thickness. The specimen sets for PDI qualification of weld overlay examinations include construction type flaws in the overlays in addition to simulated service flaws in the underlying base metal and weldment. Therefore, use of PDI-qualified personnel and procedures will result in the reliable detection of construction type flaws.

The ASME Section XI flaw acceptance standards are based on fracture mechanics principles that evaluate the potential effect of flaw indications on the safe operation of a component. ASME Section III ultrasonic standards, on the other hand, are derived from radiographic standards in earlier construction codes and tend to be workmanship-based, addressing flaws occurring in the original construction process that are likely to be detected by radiography. The ASME Section III acceptance criteria do not allow the presence of any cracks or crack-like indications, regardless of their size, and are geared more towards construction-type welds. Many indications that are detectable by PDI qualified ultrasonic techniques, and thus require evaluation, would not be detected by the radiographic examinations required by the original construction Code or Section III.

Responses to NRC Staff Questions Regarding ISI-3-24 and ISI-3-25

The Section XI pre-service examination standards were developed for exactly the above-stated reasons, and consider the materials in which the flaw indications are detected, the orientation and size of the indications, and ultimately their potential structural impact on the component. They are the logical choice for evaluation of potential flaw indications in post-overlay examinations, in which unnecessary repairs to the overlays would result in additional personnel radiation exposure without a compensating increase in safety and quality, and could potentially degrade the effectiveness of the overlays by affecting the favorable residual stress field that they produce.

Acceptance of ultrasonic indications in weld overlay repairs using Section XI acceptance criteria has been approved by NRC in past weld overlay applications (e.g. References 1, 2).

Qualification requirements for full structural overlaid wrought austenitic piping welds, (i.e., ASME Section XI, Appendix VIII, Supplement 11 as modified by the PDI program) are not currently qualified for cast austenitic stainless steel. The safety valve nozzle safe ends, surge nozzle safe end, and stainless steel weld adjacent to the surge nozzle are cast austenitic stainless steel. For the 25% of the underlying cast austenitic stainless steel of the structural weld overlay SCE will perform an UT examination using the best available technique for the pre-service and inservice inspections for these welds. This is consistent with information provided to support the Unit 2 relief request ISI-3-18, reproduced as follows:

Question and Response from the March 17, 2006, letter from Mr. A. E. Scherer; Subject: Docket Nos. 50- 361, Additional Information Supporting the Third Ten-Year Inservice Inspection (ISI) Interval Relief Request ISI-3-18 Use of Structural Weld Overlay and Associated Alternative Repair Techniques, San Onofre Nuclear Generating Station, Unit 2.

NRC Question 11:

The Appendix VIII, Supplement 11 qualification of the procedures and personnel did not cover examinations of cast stainless steel (CSST) piping/components. The dissimilar weld configuration has a CSST safe-end/pipe component. For the UT technique that will be used on the CSST piping, discuss the qualification process that will be used to satisfy Supplement 11 performance demonstration for detection of flaws, i.e., blind performance demonstration, representative flaws, representative mock-ups, and pass/fail screening criteria.

SCE Response to Question 11:

Because the three safety nozzle safe ends are cast austenitic material, a qualified UT technique to examine the weld overlay plus 25% of the base material under the overlay does not exist.

SCE is using the best available UT technique to perform the pre-service and inservice inspections, and will work with the industry to demonstrate this UT technique has the ability to detect flaws in the cast material. SCE proposes to complete this demonstration within the next two cycles of operation (approximately 4-years).

To meet this commitment SCE will coordinate with the EPRI NDE Center in developing techniques and a qualification process to address this examination. The EPRI NDE Center is responsible for administering the Performance Demonstration Initiative (PDI) program. The PDI program is an industry-funded program that was established to provide a uniformed approach to meeting Appendix VIII qualification issues. It is expected that EPRI will work closely with the PDI Steering Committee in developing the most appropriate qualification plan, which will address flaw making, mock-up design and acceptance criteria needed to demonstrate the techniques.

This after-the-fact demonstration is an appropriate approach, because 1) the weld overlay is a full structural overlay that does not take any credit for the original weld, 2) the material used in the weld overlay is Alloy 52M, which is resistant to PWSCC due to the composition and especially its Cr content, 3) the flaws detected in nozzles 27 and 28 are in the lower 1/3 of the base material near the ID and well within the favorable compressive stress field induced by the weld overlay, that limits their growth, and 4) the flaws detected in nozzles 27 and 28 were confirmed to be not surface connecting by eddy current examination.

NRC Question 2:

Provide a commitment to provide within 14 days from completion of UT examination of the weld overlays, a report that summarizes the results of the examinations, consistent with the September 14, 2006 letter from Exelon to NRC regarding Byron Station, Unit 1 Relief Request I3R-03.

SCE Response to Question 2: (Applies to both ISI-3-24 and ISI-3-25)

A report that summarizes the results of the examinations will be submitted to the NRC within fourteen days of completion of the final UT examination. The report will include the following details as applicable,

Responses to NRC Staff Questions Regarding ISI-3-24 and ISI-3-25

- a listing of indications detected¹
- the disposition of all indications using the standards of ASME Section XI, IWB-3514-2 and/or IWB-3514-3 criteria
- the type and nature of the indications,² and
- a discussion of any repairs to the overlay material and/or base metal and the reason for the repair.

References:

- (1) Safety Evaluation by the Office of Nuclear Reactor Regulation related to Three Mile Island Nuclear Station, Unit 1 (TMI-1) Request for Relief from Flaw Removal, Heat Treatment and Non-Destructive Examination (NDE) Requirements for the Third 10-Year Inservice Inspection (ISI) Interval, Amergen Energy Company, LLC Docket No. 50-289, July 21, 2004.
- (2) Safety Evaluation by the Office of Nuclear Reactor Regulation Inservice Inspection Program Relief Request ISIR-17, Donald C. Cook Nuclear Plant, Unit 1 (DCCNP-1), Indiana Michigan Power, Docket No. 50-315, February 10, 2006.

¹ The recording criteria of the ultrasonic examination procedure to be used for the examination of the SONGS pressurizer overlays (SI-UT-126 and/or SI-UT-128) requires that all indications, regardless of amplitude, be investigated to the extent necessary to provide accurate characterization, identity, and location. Additionally, the procedure requires that all indications, regardless of amplitude, that cannot be clearly attributed to the geometry of the overlay configuration be considered flaw indications.

² The ultrasonic examination procedure requires that all suspected flaw indications are to be plotted on a cross sectional drawing of the weld and that the plots should accurately identify the specific origin of the reflector.